

What is claimed is:

1. A bump forming method of forming bumps at specific positions on a main surface of a semiconductor substrate, comprising the steps of:
 - 5 setting a positioning member above a heating device, where the positioning member has a plate body in which positioning holes for positioning bump materials are provided at predetermined positions which correspond to the specific positions on the main surface of the semiconductor substrate, and at least a portion of a top face of the heating device is provided as a heating surface for heating the bump materials;
 - 10 inserting the bump materials into the positioning holes and making the bump materials partially protrude from the holes toward a side opposite to the heating device;
 - positioning the semiconductor substrate onto the positioning member so that the semiconductor substrate faces the protruding side of the bump materials;
 - heating the bump materials by using the heating device and simultaneously
 - 15 pressing the bump materials from the protruding side of the materials via the semiconductor substrate by a pressing device; and
 - bonding the bump materials at the specific positions on the main surface of the semiconductor substrate.
- 20 2. A bump forming method as claimed in claim 1, further comprising the step of:
 - generating ultrasonic waves toward the bump materials by using an ultrasonic oscillating device when the bump materials are heated and pressed, so as to improve contact strength between the bump materials and the semiconductor substrate.
- 25 3. A bump forming apparatus for forming bumps at specific positions on a main

surface of a semiconductor substrate, the apparatus comprising:

a heating device in which at least a portion of a top face is provided as a heating surface for heating bump materials;

a positioning member set above the heating device, the positioning member
5 having a plate body in which positioning holes for positioning the bump materials are provided at predetermined positions which correspond to the specific positions on the main surface of the semiconductor substrate; and

a pressing device for pressing the bump materials inserted in the positioning holes via the semiconductor substrate positioned onto the positioning member while the
10 bump materials are heated by the heating device, where the bump materials to be pressed are partially protruded from the positioning holes toward a side opposite to the heating device and the semiconductor substrate faces the protruding side of the bump materials.

4. A bump forming apparatus as claimed in claim 3, wherein the heating device
15 has a plate body and a main surface of the plate body functions as the heating surface, and a heating source is built inside the heating device.

5. A bump forming apparatus as claimed in claim 3, wherein the bump materials
are bump balls and the positioning member has a thickness less than the maximum
20 diameter of the bump balls.

6. A bump forming apparatus as claimed in claim 3, wherein the positioning
member has a first magnetic material and the heating device has a second magnetic
material, so that a predetermined space is secured between the positioning member and
25 the heating device which face each other, according to repulsive force produced by the

first and second magnetic materials.

7. A bump forming apparatus as claimed in claim 3, further comprising an electrostatic charge dissipating device for dissipating electrostatic charge of the bump
5 balls.

8. A bump forming apparatus as claimed in claim 3, further comprising an ultrasonic oscillating device for generating ultrasonic waves toward the bump materials.